

CLAIMS

- 1 1. A wireless communication network comprising:
2 at least one network cell;
3 a base station located in the at least one network cell and associated with the
4 network cell for receiving uplink communication signals and transmitting downlink
5 communication signals;
6 at least one remote emitter remotely located in the at least one network cell;
7 and
8 a communication link between the base station and the at least one remote
9 emitter;
10 wherein all of the uplink communication signals to the base station are
11 directly received and processed by the base station, and at least one of the downlink
12 communication signal from the base station are processed by the at least remote
13 emitter and sent from the base station via the at least one remote emitter.
- 1 2. The wireless communication network of claim 1, wherein the network is a
2 spread-spectrum based, code division multiple access (CDMA) type network.
- 1 3. The wireless communication network of claim 2, wherein the network is a
2 spread-spectrum based, wide band CDMA network.
- 1 4. The wireless communication network of claim 1, wherein the at least one
2 remote emitter comprises a remote downlink emitter (RDT) located at a site remote
3 from the base station and contains no processing capability for uplink communication
4 signals to the base station.

1 5. The wireless communication network of claim 1, wherein the uplink
2 communication signals comprise at least one communication signal received by the
3 base station from at least one user equipment (UE) located within the at least one
4 network cell associated with the base station.

1 6. The wireless communication network of claim 1, wherein the at least one
2 network cell comprises a plurality of network cells; and
3 the uplink communication signals comprise at least one communication signal
4 received by the base station from a UE located in a network cell other than the cell to
5 which the base station is associated.

1 7. The wireless communication network of claim 1, wherein the
2 communication link between the base station and the at least one remote emitter
3 comprises an out-of-band radio frequency (RF) communication link.

1 8. The wireless communication network of claim 1, wherein the
2 communication link between the base station and the at least one remote emitter
3 comprises a landline connected communication link.

1 9. The wireless communication network of claim 1, wherein the
2 communication link between the base station and the at least one remote emitter
3 comprises an internet protocol (IP) network.

1 10. The wireless communication network of claim 9, wherein the IP network
2 is the Internet.

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1 11. The wireless communication network of claim 9, wherein the IP network
2 is a dedicated private data network for the communication link between the base
3 station and the at least one remote emitter.

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1 12. The wireless communication network of claim 1, wherein the at least one
2 network cell is divided into a plurality of sectors for signal reception and signal
3 processing by the base station, and the at least one remote emitter comprises at least
4 one remote emitter assigned to each of the plurality of physical sectors.

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1 13. The wireless communication network of claim 12, wherein the divided
2 plurality of sectors of the at least one network cell comprise physical sectors of the
3 base station.

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1 14. The wireless communication network of claim 12, wherein the at least one
2 remote emitter forms a part of a logical sector of the base station.

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1 15. The wireless communication network of claim 1, wherein the at least one
2 remote emitter processes the at least one downlink communication signal by receiving
3 the downlink signal from the base station, performing physical layer processing of the
4 downlink signal, and transmitting the processed downlink signal.

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1 16. The wireless communication network of claim 15, wherein the physical
2 processing of the downlink signal comprises increasing a data rate of the downlink
3 signal.

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1 17. The wireless communication network of claim 15, wherein the processed
2 downlink signal is transmitted to and recognized by a UE located within the at least
3 one network cell.

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1 18. The wireless communication network of claim 1, wherein the at least one
2 remote emitter processes the at least one downlink communication signal by coding,
3 interleaving, spreading, and scrambling the downlink signal.

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1 19. The wireless communication network of claim 14, wherein the logical
2 sector emits common channeling signals identical to those emitted by the plurality of
3 physical sectors

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1 20. A wireless cellular communication network comprising:
2 a plurality of network cells;
3 a first base station assigned to a first one of the plurality of network cells to
4 receive uplink communication signals and transmit downlink communication signals;
5 a second base station assigned to a second one of the plurality of network cells
6 to receive uplink communication signals and transmit downlink communication
7 signals;

8 at least one first remote emitter separately located from the base station and
9 assigned to a first one of the plurality of network cells;

10 at least one second remote emitter assigned to a second one of the plurality of
11 network cells;

12 a first communication link between the first base station and the at least one
13 first remote emitter; and

14 a second communication link between the second base station and the at least
15 one second remote emitter;

16 wherein all of the uplink communication signals to the first base station are
17 directly received and processed by the first base station, and at least one of the
18 downlink communication signals from the base station is received, processed, and re-
19 transmitted by the at least one first remote emitter.

1 21. The wireless cellular communication network of claim 20, further
2 comprising a first managing tool assigned to the first network cell, wherein the
3 managing tool dynamically and independently controls assignments of all the uplink
4 and downlink communication signals to the first base station and the at least one first
5 remote emitter.

1 22. The wireless cellular communication network of claim 21, wherein the
2 first managing tool further controls assignment of uplink communication signals to
3 the second base station.

1 23. The wireless cellular communication network of claim 21, wherein the
2 first management tool is implemented at the first base station.

1 24. The wireless cellular communication network of claim 20, wherein some
2 of the uplink communication signals processed by the first base station are directly
3 received by the first base station from at least one user equipment (UE) assigned to
4 the first network cell.

1 25. The wireless cellular communication network of claim 20, further
2 comprising a downlink managing tool that determines availability of the at least one

3 first remote emitter for downlink registration or access of a UE located in the first
4 network cell.

1 26. The wireless cellular communication network of claim 20, further
2 comprising a managing tool that controls availability of the second base station to
3 receiving uplink communication signals from a UE located in the first network cell.

1 27. The wireless cellular communication network of claim 25, wherein the
2 downlink managing tool determines the availability of the at least one first remote
3 emitter for downlink registration or access of a UE located in the first network cell
4 based at least on performance metrics of the at least one first remote emitter.

1 28. The wireless cellular communication network of claim 25, wherein the
2 downlink managing tool determines the availability of the at least one first remote
3 emitter for downlink registration or access of a UE located in the first network cell
4 based at least on health metrics of the first communication link.

1 29. The wireless cellular communication network of claim 25, wherein the
2 downlink managing tool determines the availability of the at least one first remote
3 emitter for downlink registration or access of a UE located in the first network cell
4 based at least on performance metrics of the first base station.

1 30. The wireless cellular communication network of claim 20, further
2 comprising a downlink managing tool that determines availability of the at least one
3 first remote emitter for downlink communication with a UE based at least on a
4 performance metric of the at least one first remote emitter, a performance metric of
5 the first base station, and a health metric of the first communication link.

1 31. A method for increasing user capacity and coverage area of a wireless
2 communication network comprising:
3 detecting an uplink communication signal from a first user of the network;
4 assigning the user to a designated area of the network;
5 receiving the uplink communication signal directly from the first user to a base
6 station assigned to the designated area;
7 processing the uplink communication signal at the base station;
8 preparing a downlink communication signal for transmission to a second user
9 of the network;
10 assigning a remote emitter to the designated area of the network or the base
11 station;
12 determining whether to use the base station or the remote emitter for
13 transmission of the downlink communication signal to the second user;
14 transmitting the downlink communication signal to the second user directly
15 from either the base station or the remote emitter based on the determining.

1 32. The method of claim 31, wherein the first user and the second user are the
2 same user.

1 33. The method of claim 31, wherein the first user and the second user are
2 different users.

1 34. The method of claim 31, further comprising:
2 providing a communication link between the base station and the remote
3 emitter.

1 35. The method of claim 31, wherein determining whether to use the base
2 station or the remote emitter comprises:

3 determining loading conditions of the remote emitter and the base station.

1 36. The method of claim 31, wherein determining whether to use the base
2 station or the remote emitter comprises:

3 determining loading conditions of the remote emitter and the base station.

1 37. The method of claim 34, wherein providing a communication link
2 between the base station and the remote emitter comprises:

3 routing signals between the base station and the remote emitter via an IP
4 network.

1 38. The method of claim 31, wherein the downlink communication signal
2 comprises a digital signal, and remote emitter comprises a digital-to-analog converter
3 for converting the digital downlink communication signal into an analog signal for
4 transmission to the second user.

1 39. The method of claim 32, wherein the remote emitter further comprises an
2 integrated power amplifier and high power RF antenna device for transmitting the
3 analog downlink communication signal to the second user.

1 40. The method of claim 39, wherein the integrated power amplifier and high
2 power RF antenna device is implemented as a multilayer printed wiring board
3 package.

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